DETAILED ACTION

1. This Office Action has been issued in response to Applicant's Amendment filed August 16, 2011.

2. Claims 1, 21, 26 and 28 have been amended. Claims 1-32 are pending in the application.

Response to Arguments

3. Applicant's arguments filed August 16, 2011 have been fully considered but they are not persuasive. Applicant argues in view of the amendments the Office Action does not present a prima facie case of obviousness. Examiner disagrees for the rationale provided in the rejection below.

Claim Rejections - 35 USC § 112

4. In view of the arguments and amendments made the pending claim rejections under 35 USC § 112 have been withdrawn.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1, 3, 5-9, 12-25 and 28-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pub. No. 2004/0054813 to Boucher et al. (hereinafter "Boucher") and further in view of US Pat. No. 6687758 to Craft et al. (hereinafter "Craft") and further in view of US Pat. No. 6963932 to Bhat (hereinafter "Bhat").

8. **As to Claim 1,** Boucher discloses **a system for communications, comprising: a transport layer/network layer processing stack** (Figure 31 of Boucher discloses a Microsoft TCP/IP Driver)**; and [an intermediate driver] coupled to the transport layer/network layer processing stack via a first miniport and a second miniport** (Figure 31 of Boucher discloses the Microsoft TCP/IP driver being connected to a 3COM miniport driver and an INIC miniport driver)**, the [intermediate driver] concurrently supporting at least two software objects, wherein the first miniport supports a first VLAN group and comprises a first software object that is dedicated to [teamed] traffic, wherein the second miniport supports a second VLAN group and comprises a second software object that is dedicated to uploaded traffic in a system that can offload traffic** (Figure 31 of Boucher discloses the Microsoft TCP/IP driver being

connected to a 3COM miniport driver and an INIC miniport driver. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC), accordingly it is seen that the INIC miniport driver would support offloading. Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs)**, wherein the uploaded traffic in the system that can offload traffic and the [teamed] traffic pass through the intermediate driver** (Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic)**, wherein offloaded traffic in the system that can offload traffic bypasses the intermediate driver** (Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065])**;,**

a first network interface card coupled to the [intermediate driver], via a first respective physical port, wherein the [teamed] traffic passes through the first network interface card (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs)**; and**

a second network interface card coupled to the [intermediate driver] via a second respective physical port, wherein the second network interface card, that is part of the system that can offload traffic, communicates with the first miniport and the second miniport via the second respective physical port, wherein the [teamed] traffic, the uploaded traffic and the offloaded traffic pass through the second network interface card, (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC

devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Figure 31 discloses a miniport driver able to send traffic to another stack. Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic. Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065].)

[wherein the second network interface card concurrently participates in a team with the first network interface card for a first type of traffic] via the first software object that supports the first VLAN group and in the system that can offload traffic for a second type of traffic wherein the system that can offload traffic comprises an upload path that passes through the intermediate driver and an offload path that bypasses the intermediate driver, wherein the second network interface card participates on the upload path through the second software object that is dedicated to uploaded traffic in the system that can offload traffic (Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic. Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065]. Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Figure 31 discloses a miniport driver able to send traffic to another stack),

wherein a third network interface card is coupled to the intermediate driver via a third respective physical port and [participates in the team with the first network interface card and the second network interface card via the first software object], and wherein

(Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC)),

[if the third network interface card fails, then the first network interface card and the second network interface card handle, via the first software object, a load previously supported by the failed third network interface card],

Boucher does not explicitly disclose an **intermediate driver** being coupled.

However, Bhat discloses this. Column 3 lines 1-20 of Bhat discloses an NDIS intermediate driver being connected to the transport protocol via multiple miniport instances.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the INIC system as disclosed by Boucher, with connecting the intermediate driver via multiple miniport instances as disclosed by Boucher. One of ordinary skill in the art would have been motivated to combine to apply a known technique to a known device. It is seen in paragraph [0479] of Boucher that the system can utilize an NDIS and as such it would be obvious to apply the techniques of Bhat on this NDIS.

Boucher does not explicitly disclose **teamed** traffic and **wherein the second network interface card concurrently participates in a team with the first network interface card for a first type of traffic** and **participates in the team with the first network interface card and the second network interface card via the first software object** and **if the third network interface card fails, then the first network interface card and the second network interface card handle, via the first software object, a load previously supported by the failed third network interface card**

However, Craft discloses this. Figure 1 of Craft discloses using a port aggregation driver between the INIC device driver and the stack. Column 5 lines 53 – 54 of Craft discloses that port aggregation and fail-over switching mechanisms are provided across multiple INICs

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the INIC system as disclosed by Boucher, with supporting teaming as disclosed by Craft. One of ordinary skill in the art would have been motivated to combine because Boucher claims the benefit of Craft in paragraph [0003] of Boucher.

9. **As to Claim 3,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein the first network interface card comprises a plurality of network interface cards** (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs)**.**

10. **As to Claim 5,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein the second network interface card is the only network interface card that supports traffic from the system that can offload traffic from the transport layer/network layer processing stack** (Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Accordingly it is seen that only the INIC supports offloading)**.**

11. **As to Claim 6,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein the transport layer/network layer processing stack comprises a transmission control protocol/internet protocol (TCP/IP) stack** (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs)**.**

12. **As to Claim 7,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein the first miniport comprises a virtual miniport instance** (Column 3 lines 15-25 of Bhat disclose a miniport instance is created by a miniport driver and accordingly it is seen that each miniport instance is a virtual instance)**.**

Examiner recites the same rationale to combine used in claim 1.

13. **As to Claim 8,** Boucher-Bhat-Craft discloses **the system according to claim 7, wherein the virtual miniport instance comprises a virtual miniport instance adapted for teamed traffic** (Figure 1 of Craft discloses using a port aggregation driver between the INIC device driver and the stack)

Examiner recites the same rationale to combine used in claim 1.

14. **As to Claim 9,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein the second miniport comprises a virtual miniport instance** (Column 3 lines 15-25 of Bhat disclose a miniport instance is created by a miniport driver and accordingly it is seen that each miniport instance is a virtual instance)**.**

Examiner recites the same rationale to combine used in claim 1.

15. **As to Claim 12,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein the second miniport supports traffic that is processed by the transport layer/network layer processing stack** (Figure 31 of Boucher discloses the Microsoft TCP/IP driver being connected to a 3COM miniport driver and an INIC miniport driver. Accordingly it is seen that the INIC miniport driver would support the traffic).

16. **As to Claim 13,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein the second miniport supports traffic that has not been offloaded by the system that can offload traffic from the transport layer/network layer processing stack** (Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic).

17. **As to Claim 14,** Boucher-Bhat-Craft discloses **the system according to the claim 1, wherein traffic that has been offloaded by the system that can offload traffic from the transport layer/network layer processing stack bypasses the transport layer/network layer processing stack and the intermediate driver** (Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065]).

18. **As to Claim 15,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein the intermediate driver supports teaming through a first path to the transport layer/network layer processing stack and uploading through a second path to the transport**

layer/network layer processing stack, the second path being a non-offload path (Figure 1 of Craft discloses using a port aggregation driver between the INIC device driver and the stack. Figure 10 of Boucher discloses there being two paths).

Examiner recites the same rationale to combine used in claim 1.

19. **As to Claim 16,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein the intermediate driver comprises a network driver interface specification (NDIS) intermediate driver** (Paragraph [0479] of Boucher that the system can utilize an NDIS).

20. **As to Claim 17,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein the intermediate driver is aware of the system that can offload traffic from the transport protocol/network protocol processing stack** (Column 5 lines 1 – 10 of Craft discloses that since the fast-path conditions described involve offloading control and processing of a connection to either of the INICs in association with the ports the fast-path and port aggregation protocol need to be synchronized).

Examiner recites the same rationale to combine used in claim 1.

21. **As to Claim 18,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein teaming supports load balancing** (Column 6 lines 35 – 37 of Craft discloses that the port aggregation switch may change the port selection for load balancing purposes).

Examiner recites the same rationale to combine used in claim 1.

22. **As to Claim 19,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein teaming supports fail over** (Column 5 lines 53 – 54 of Craft discloses that port aggregation and fail-over switching mechanisms are provided across multiple INICs)**.**

Examiner recites the same rationale to combine used in claim 1.

23. **As to Claim 20,** Boucher-Bhat-Craft discloses **the system according to claim 1, wherein teaming supports virtual network capabilities** (Column 3 lines 1-25 of Bhat discloses the system supporting virtual LANs and virtual network interface cards)**.**

Examiner recites the same rationale to combine used in claim 1.

24. **As to Claim 21,** Boucher discloses **a system for communications, comprising: a first set of network interface cards comprising a second set and a third set of network interface cards, the second set comprising a network interface card that is capable of offloading one or more connections, the third set comprising one or more network interface cards that are not capable of providing an offload path** (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC))**; and**

[an intermediate driver coupled to the second set and to the third set, the intermediate driver being part of a host computer and supporting teaming over the second set and the third set] the [intermediate driver] concurrently supporting at a first software object and a second software object, wherein the first software object supports a first VLAN group and

is dedicated to [teamed] traffic, wherein the second software object supports a second VLAN group and is dedicated to uploaded traffic in a system that can offload traffic (Figure 31 of Boucher discloses the Microsoft TCP/IP driver being connected to a 3COM miniport driver and an INIC miniport driver. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC), accordingly it is seen that the INIC miniport driver would support offloading. Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs)**, wherein the uploaded traffic in the system that can offload traffic and the [teamed] traffic pass through the intermediate driver** (Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic)**, wherein offloaded traffic in the system that can offload traffic bypasses the intermediate driver** (Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065])**;**

[a host protocol processing stack coupled to the intermediate driver via the first software object and the second software object],

wherein each network interface card of the second set is coupled to the intermediate driver via a first respective physical port, wherein the teamed traffic and the uploaded traffic pass through the first respective physical port, wherein the teamed traffic passes through the first software object and the first respective physical port, wherein the uploaded traffic passes through the second software object and the first respective physical port, wherein each network interface card of the second set communicates with the first software object and the second software object via the first respective physical port, wherein each network

interface card of the second set supports the teamed traffic, the uploaded traffic and the offloaded traffic (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Figure 31 discloses a miniport driver able to send traffic to another stack. Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic. Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065].),

[wherein the second set of network interface cards concurrently participates in a team with the third set of network interface cards for a first type of traffic] and in the system that can offload traffic for a second type of traffic that bypasses the intermediate driver, wherein the first type of traffic is not capable of being offloaded, wherein the second type of traffic is capable of being offloaded (Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC)),

[wherein a fourth set of network interface cards are coupled to the intermediate driver, and wherein, if a particular network interface card in the fourth set of network interface cards fails, then a plurality of network interface cards from the first set handle, via the first software object, a load previously supported by the failed network interface card of the fourth set],

Boucher does not explicitly disclose **an intermediate driver coupled to the second set and to the third set, the intermediate driver being part of a host computer and supporting**

teaming over the second set and the third set and **teamed** traffic **and wherein the second set of network interface cards concurrently participates in a team with the third set of network interface cards for a first type of traffic** and **wherein a fourth set of network interface cards are coupled to the intermediate driver, and wherein, if a particular network interface card in the fourth set of network interface cards fails, then a plurality of network interface cards from the first set handle, via the first software object, a load previously supported by the failed network interface card of the fourth set**

However, Craft discloses this. Figure 1 of Craft discloses using a port aggregation driver between the INIC device driver and the stack. Column 6 lines 35 – 37 of Craft discloses that the port aggregation switch may change the port selection for load balancing purposes. Column 5 lines 53 – 54 of Craft discloses that port aggregation and fail-over switching mechanisms are provided across multiple INICs

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the INIC system as disclosed by Boucher, with supporting teaming as disclosed by Craft. One of ordinary skill in the art would have been motivated to combine because Boucher claims the benefit of Craft in paragraph [0003] of Boucher.

Boucher does not explicitly disclose **a host protocol processing stack coupled to the intermediate driver via the first software object and the second software object**

However, Bhat discloses this. Column 3 lines 1-20 of Bhat discloses an NDIS intermediate driver being connected to the transport protocol via multiple miniport instances. Column 3 lines 15-25 of Bhat disclose a miniport instance is created by a miniport driver and accordingly it is seen that each miniport instance is a virtual instance.

Examiner recites the same rationale to combined use in claim 1.

25. **As to Claim 22,** Boucher-Craft-Bhat discloses **the system according to claim 21, wherein the second set provides a kernel bypass path and wherein the third set does not provide a kernel bypass path** (Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC))**.**

26. **As to Claim 23,** Boucher-Craft-Bhat discloses **the system according to claim 21, wherein the second set is associated with a system that is capable of offloading one or more connections** (Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC))**,**
wherein the system that is capable of offloading one or more connections offloads a particular connection (Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC))**, and**
wherein packets carried by the particular offloaded connection bypass the intermediate driver (Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065])**.**

27. **As to Claim 24,** Boucher-Craft-Bhat discloses **the system according to claim 21, wherein intermediate driver provides fail over procedures** (Column 5 lines 53 – 54 of Craft

discloses that port aggregation and fail-over switching mechanisms are provided across multiple INICs).

Examiner recites the same rationale to combine used in claim 1.

28. **As to Claim 25,** Boucher-Craft-Bhat discloses **the system according to claim 21, wherein the host computer communicates, via a team of network interface cards form the second set and the third set , with a remote peer over a network** (Figure 3 of Boucher discloses receiving a packet from the network)

29. **As to Claim 28,** Boucher discloses **a method for communicating, comprising: [teaming] a plurality of network interface cards of a host computer, the plurality of network interface cards not providing an offload path that bypasses a kernel of the host computer** (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC))**;**
adding a first additional network interface card to the host computer, the first additional network interface card concurrently supporting at least three paths including an offload path, an upload path and [a team path], the offload path of a load system that can offload bypassing the kernel of the host computer (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC)) **the upload path of the system that can offload passing through the kernel of the host computer**

(Figure 6 of Boucher discloses the slow path), **the system that can offload being used for a first type of traffic, the team path being used for a second type of traffic, the first type of traffic being capable of being offloaded by the system that can offload, the second type of traffic not being capable of offloaded by the system that can offload the upload path passing through a first miniport that is dedicated to uploaded traffic** (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Figure 31 shows that the TCP/IP driver is connected via miniport drivers and accordingly would receive traffic from the NICs via the miniports. Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic. Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065].), **[the first miniport being communicatively disposed between an intermediate driver and the host TCP/IP processing stack]**

[teaming the plurality of network interface cards and the first additional network interface card, the teamed traffic passing through [a second miniport communicatively disposed between the intermediate driver and the host TCP/IP processing stack], wherein the first additional network interface card concurrently supports [teaming], offloading and uploading (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC));

[providing, by the intermediate driver load balancing over the plurality of network interface cards and the additional network interface card], [the intermediate driver being

communicatively disposed between (1) the host TCP/IP processing stack and (2) the plurality of networking interface cards and the additional network interface card] [wherein the intermediate driver concurrently supports teaming through the team path to the host TCP/IP processing stack] and uploading through the upload path to the host TCP/IP processing stack (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC));
the intermediate driver concurrently supporting at least two software objects, wherein the second miniport supports a first VLAN group and comprises a first software object that is dedicated to the teamed traffic, wherein the first miniport supports a second VLAN group and comprises a second software object that is dedicated to uploaded traffic in the system that can offload traffic (Figure 31 of Boucher discloses the Microsoft TCP/IP driver being connected to a 3COM miniport driver and an INIC miniport driver. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC), accordingly it is seen that the INIC miniport driver would support offloading. Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs), **wherein the uploaded traffic in the system that can offload traffic and the teamed traffic pass through the intermediate driver** (Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic), **wherein offloaded traffic in the system that can offload traffic bypasses the intermediate driver** (Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing.

Paragraph [0065]), **wherein the first additional interface card is coupled to the intermediate driver through a respective physical port, wherein the teamed traffic passes through the respective physical port and the first software object, wherein the uploaded traffic passes through the respective physical port and the second software object, wherein the offloaded traffic bypasses the intermediate driver and does not pass through the respective physical port, the first software object or the second software object** (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Figure 31 discloses a miniport driver able to send traffic to another stack. Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic. Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065].)**; and**

[adding a second additional network interface card to the host computer, wherein, if the second network interface card fails, then at least two network interface cards of the first additional network interface card and/or the plurality of network interface cards handle via the first software object, a load previously supported by the failed second additional network interface card].

Boucher does not explicitly disclose **teaming** and **a team path** and **teaming the plurality of network interface cards and the additional network interface card** and **providing, by the intermediate driver load balancing over the plurality of network interface cards and the additional network interface card** and **wherein the intermediate**

driver concurrently supports teaming through the team path to the host TCP/IP processing stack and **adding a second additional network interface card to the host computer, wherein, if the second network interface card fails, then at least two network interface cards of the first additional network interface card and/or the plurality of network interface cards handle via the first software object, a load previously supported by the failed second additional network interface card**

However, Craft discloses this. Figure 1 of Craft discloses using a port aggregation driver between the INIC device driver and the stack. Column 6 lines 35 – 37 of Craft discloses that the port aggregation switch may change the port selection for load balancing purposes. Wherein port aggregation is layer 2 load balancing since it affects the NICs and accordingly their corresponding drivers. Column 5 lines 53 – 54 of Craft discloses that port aggregation and fail-over switching mechanisms are provided across multiple INICs

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the INIC system as disclosed by Boucher, with supporting teaming as disclosed by Craft. One of ordinary skill in the art would have been motivated to combine because Boucher claims the benefit of Craft in paragraph [0003] of Boucher.

Boucher does not explicitly disclose **the first miniport being communicatively disposed between an intermediate driver and the host TCP/IP processing stack** or **a second miniport communicatively disposed between the intermediate driver and the host TCP/IP processing stack** or **the intermediate driver being communicatively disposed between (1) the host TCP/IP processing stack and (2) the plurality of networking interface cards and the additional network interface card**

However, Bhat discloses this. Column 3 lines 1-20 of Bhat discloses an NDIS intermediate driver being connected to the transport protocol via multiple miniport instances. Figure 2 discloses the intermediate driver being disposed between the VLANs and the VNICs.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the INIC system as disclosed by Boucher, with connecting the intermediate driver via multiple miniport instances as disclosed by Boucher. One of ordinary skill in the art would have been motivated to combine to apply a known technique to a known device. It is seen in paragraph [0479] of Boucher that the system can utilize an NDIS and as such it would be obvious to apply the techniques of Bhat on this NDIS.

30. **As to Claim 29,** Boucher-Craft-Bhat discloses **the method according to claim 28, further comprising: handling packets of a particular connection only via the additional network interface card, the particular connection being maintained by the off load system that is capable of offloading traffic from the host TCP/IP processing stack** (Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Accordingly it is seen that only the INIC supports offloading).

31. **As to Claim 30,** Boucher-Craft-Bhat discloses **the method according to claim 28, wherein the intermediate driver provides fail over procedures** (Column 5 lines 53 – 54 of Craft discloses that port aggregation and fail-over switching mechanisms are provided across multiple INICs).

Examiner recites the same rationale to combine used in claim 28.

32. **As to Claim 31,** Boucher-Craft-Bhat discloses **the method according to claim 28, further comprising: processing packets of a particular connection via the host TCP/IP processing stack, the particular connection not being an offloaded connection although being maintained by the offload system that is capable of offloading traffic from the host protocol stack** (Paragraphs [0267]-[0269] of Boucher discloses the ATCP stack being able to perform slow path processing)**.**

33. **As to Claim 32,** Boucher-Craft-Bhat discloses **the method according to claim 31, further comprising: transmitting the processed packets only through the additional network interface card** (Paragraph [0478] of Boucher discloses the ATCP driver will be bound exclusively to INIC devices)**.**

34. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher-Bhat-Craft and further in view of US Pat. No. 6308282 to Huang et al. (hereinafter "Huang").

35. **As to Claim 2,** Boucher-Bhat-Craft discloses **the system according to claim 1.** Boucher-Bhat-Craft does not explicitly disclose **wherein a first NDIS Miniport is communicatively disposed between the intermediate driver and the first interface card, and wherein a second NDIS miniport is communicatively disposed between the intermediate driver and the second network interface card, and wherein a virtual bus driver is**

communicatively disposed between the second NDIS miniport and the second network interface card.

However, Huang discloses this. Figure 4 of Huang discloses multiple miniport's being associated with multiple NICs.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of claim 1 as disclosed by Boucher-Bhat-Craft, with the miniport structure as disclosed by Huang. One of ordinary skill in the art would have been motivated to combine to implement a known technique to a known device.

36. Claims 4, 10, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher-Bhat-Craft and further in view of US Pat. No. 7376755 to Pandya (hereinafter "Pandya").

37. **As to Claim 4,** Boucher-Bhat-Craft discloses **the system according to claim 1.** Boucher-Bhat-Craft does not explicitly disclose **wherein the second network interface card comprises a remote-direct-memory-access-enabled (RDMA-enabled) network interface card.**

However, Pandya discloses this. Column 11 lines 20-25 of Pandya disclose once both peers of the communication are ready to use the RDMA mechanism, the data transfer from RDMA regions can happen with essentially zero copy overhead from the source to the destination without substantial host intervention if NIC/HBA hardware in the peers implement RDMA capability

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the INIC system as disclosed by Boucher, with having NICs implement RDMA capabilities as disclosed by Pandya. One of ordinary skill in the art would have been motivated to combine such that data transfer from RDMA regions can happen with essentially zero copy overhead form the source to the destination without substantial host intervention (Column 11 lines 20-25 of Pandya).

38. **As to Claim 10,** Boucher-Bhat-Craft discloses **the system according to claim 9.** Boucher-Bhat-Craft does not explicitly disclose **wherein the virtual miniport instance comprises an RDMA-enabled virtual miniport instance.**

However, Pandya discloses this. Column 11 lines 20-25 of Pandya disclose once both peers of the communication are ready to use the RDMA mechanism, the data transfer from RDMA regions can happen with essentially zero copy overhead from the source to the destination without substantial host intervention if NIC/HBA hardware in the peers implement RDMA capability

Examiner recites the same rationale to combine used in claim 4.

39. **As to Claim 26,** Boucher discloses **a method for communicating, comprising: (a) [teaming a plurality] of network interface cards [using an intermediate driver] of a host computer, [the intermediate driver providing load balancing over some or all of the network interface cards and providing fail over procedures], [wherein the plurality of network interface cards support remote direct memory access (RDMA) traffic], wherein**

teamed traffic passes through [a first miniport that is communicatively disposed between a host TCP/IP stack and the intermediate driver] , the intermediate driver concurrently supporting at least two software objects, wherein the first miniport supports a first VLAN group and comprises a first software object that is dedicated to the teamed traffic, wherein the second miniport supports a second VLAN group and comprises a second software object that is dedicated to uploaded traffic in a system that can offload traffic (Figure 31 of Boucher discloses the Microsoft TCP/IP driver being connected to a 3COM miniport driver and an INIC miniport driver. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC), accordingly it is seen that the INIC miniport driver would support offloading. Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs)**, wherein the uploaded traffic in the system that can offload traffic and the teamed traffic pass through the intermediate driver** (Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic)**, wherein offloaded traffic in the system that can offload traffic bypasses the intermediate driver** (Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065])**;**

(b) adapting a first network interface card of the plurality of network interface cards to concurrently support at least three paths to an application layer including an offload path, and upload path and [a team path], the offload path and the upload path being used for system that can offload traffic for a first type of traffic, the team path being used for a second type of traffic (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound

to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC))**, the upload path passing through a second software object, [the second software object being communicatively disposed between the host TCP/IP stack and the intermediate driver], the offload path bypassing the intermediate driver and the host TCP/IP stack [wherein the intermediate driver concurrently supports teaming through the team path and the first software object to the host TCP/IP stack] and uploading through the upload path and the second software object to the host TCP/IP stack, wherein the first network interface card is coupled to the intermediate driver through a respective physical port, wherein the teamed traffic passes through the respective physical port and the first software object, wherein the uploaded traffic passes through the respective physical port and the second software object, wherein the offloaded traffic bypasses the intermediate driver and does not pass through the respective physical port, the first software object or the second software object** (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC). Figure 31 discloses a miniport driver able to send traffic to another stack. Paragraph [0178] of Boucher discloses the INIC being able to operate on both fast-path and slow-path traffic. Abstract of Boucher discloses the INIC provides a fast-path that avoids protocol processing. Paragraph [0065].)**; and**

(c) adapting remaining network interface cards of the plurality of network interface cards not to provide an offload path, wherein the teamed traffic over the adapted at least one

network interface card and the adapted remaining network interface cards passing through the first software object (Paragraph [0478] of Boucher discloses the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC))

[(d) if a second network interface card coupled to the intermediate driver fails, then at least two of the plurality of network interface cards handle, via the first software object, a load previously supported by the failed second network interface card].

Boucher does not explicitly disclose **teaming** using **an intermediate driver** or **the intermediate driver providing load balancing over some or all of the network interface cards and providing fail over procedures** or **wherein the intermediate driver concurrently supports teaming through the team path to the host TCP/IP stack** or **if a second network interface card coupled to the intermediate driver fails, then at least two of the plurality of network interface cards handle, via the first software object, a load previously supported by the failed second network interface card.**

However, Craft discloses this. Figure 1 of Craft discloses using a port aggregation driver between the INIC device driver and the stack. Column 6 lines 35 – 37 of Craft discloses that the port aggregation switch may change the port selection for load balancing purposes. Column 5 lines 53 – 54 of Craft discloses that port aggregation and fail-over switching mechanisms are provided across multiple INICs

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the INIC system as disclosed by Boucher, with supporting teaming as disclosed by

Craft. One of ordinary skill in the art would have been motivated to combine because Boucher claims the benefit of Craft in paragraph [0003] of Boucher.

Boucher does not explicitly disclose **wherein plurality of network interface cards support remote direct memory access (RDMA) traffic**

However, Pandya discloses this. Column 11 lines 20-25 of Pandya disclose once both peers of the communication are ready to use the RDMA mechanism, the data transfer from RDMA regions can happen with essentially zero copy overhead from the source to the destination without substantial host intervention if NIC/HBA hardware in the peers implement RDMA capability

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the INIC system as disclosed by Boucher, with having NICs implement RDMA capabilities as disclosed by Pandya. One of ordinary skill in the art would have been motivated to combine such that data transfer from RDMA regions can happen with essentially zero copy overhead form the source to the destination without substantial host intervention (Column 11 lines 20-25 of Pandya).

Boucher does not explicitly disclose **a first miniport that is communicatively disposed between a host TCP/IP stack and the intermediate driver** or **the second miniport being communicatively disposed between the host TCP/IP stack and the intermediate driver**

However, Bhat discloses this. Column 3 lines 1-20 of Bhat discloses an NDIS intermediate driver being connected to the transport protocol via multiple miniport instances. Figure 2 discloses the intermediate driver being disposed between the VLANs and the VNICs.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the INIC system as disclosed by Boucher, with connecting the intermediate driver via multiple miniport instances as disclosed by Boucher. One of ordinary skill in the art would have been motivated to combine to apply a known technique to a known device. It is seen in paragraph [0479] of Boucher that the system can utilize an NDIS and as such it would be obvious to apply the techniques of Bhat on this NDIS.

40. **As to Claim 27,** Boucher-Craft-Pandya-Bhat disclose **the method according to claim 26, wherein (b) comprises solely associating the offload system that is capable of offloading one or more connections with a single network interface card of the plurality of network interface cards** (Paragraph [0478] of Boucher discloses the ATCP driver will be bound exclusively to INIC devices and the TCP IP driver will be bound to INIC devices as well as other types of NICs. Paragraph [0157] of Boucher discloses offloading to a cost-effective intelligent network interface card (INIC))**.**

41. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher-Bhat-Craft and further in view of "Winsock Direct and Protocol Offload on SANs" to Microsoft. (hereinafter "Microsoft").

42. **As to Claim 11**, Boucher-Bhat-Craft discloses **the system according to claim 1.** Boucher-Bhat-Craft does not explicitly disclose **wherein the system that can offload traffic**

from the transport layer/network layer processing stack comprises a Winsock Direct system

However, Microsoft discloses this. Page 2 of Microsoft discloses that Winsock Direct provides offload of the protocol stack.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the system of claim 1 as disclosed by Boucher-Bhat-Craft, with the use of Winsock Direct as disclosed by Microsoft. One of ordinary skill in the art at the time the invention was made would have been motivated to utilize Winsock Direct because (Microsoft page 1) Winsock Direct can increase system performance by freeing up CPU and memory bandwidth resources to be used by the application.

Conclusion

43. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN S. MAI whose telephone number is (571)270-5001. The examiner can normally be reached on Monday - Friday, 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on 571-272-3880. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. S. M./
Examiner, Art Unit 2456

/KEVIN BATES/
Primary Examiner, Art Unit 2456